

Claims

What is claimed is:

5 1. A method for treatment and prevention of dental caries in a mammal comprising oral administration of a genetically engineered antibody, wherein the variable region of the antibody specifically binds to a cariogenic organism and the constant region of the antibody engages the humoral immune effector systems.

2. The method for treatment and prevention of dental caries of claim 1 wherein the cariogenic organism is *Streptococcus mutans*.

10 3. The method for treatment and prevention of dental caries of claim 2 wherein the variable region of the light chain of the antibody comprises the nucleic acid sequence of SEQ ID NO: 1.

4. The method for treatment and prevention of dental caries of claim 2 wherein the variable region of the heavy chain of the antibody comprises the nucleic acid sequence of SEQ ID NO: 3.

15 5. The method for treatment and prevention of dental caries of claim 2 wherein the variable region of the light chain of the antibody comprises the nucleic acid sequence of SEQ ID NO: 5.

6. The method for treatment and prevention of dental caries of claim 2 wherein the variable region of the heavy chain of the antibody comprises the nucleic acid sequence of SEQ ID NO: 7.

7. The method for treatment and prevention of dental caries of claim 2 wherein the variable region of the light chain of the antibody comprises the nucleic acid sequence of SEQ ID NO: 9.

20 8. The method for treatment and prevention of dental caries of claim 2 wherein the variable region of the heavy chain of the antibody comprises the nucleic acid sequence of SEQ ID NO: 11.

25 9. The method for treatment and prevention of dental caries wherein the variable region of the light chain of the antibody of claim 2 comprises the amino acid sequence of SEQ ID NO: 2.

10. The method for treatment and prevention of dental caries wherein the variable region of the heavy chain of the antibody of claim 2 comprises the amino acid sequence of SEQ ID NO: 4.

11. The method for treatment and prevention of dental caries wherein the variable region of the light chain of the antibody of claim 2 comprises the amino acid sequence of SEQ ID NO: 6.

5 12. The method for treatment and prevention of dental caries wherein the variable region of the heavy chain of the antibody of claim 2 comprises the amino acid sequence of SEQ ID NO: 8.

10 13. The method for treatment and prevention of dental caries wherein the variable region of the light chain of the antibody of claim 2 comprises the amino acid sequence of SEQ ID NO: 10.

14. The method for treatment and prevention of dental caries wherein the variable region of the heavy chain of the antibody of claim 2 comprises the amino acid sequence of SEQ ID NO: 12.

15 15. A method for treatment and prevention of dental caries in a mammal comprising oral administration of a purified antibody, wherein the variable region of the antibody specifically binds to a cariogenic organism and the constant region of the antibody engages the humoral immune effector systems.

16. The method for treatment and prevention of dental caries of claim 15 wherein the cariogenic organism is *Streptococcus mutans*.

17. The method for treatment and prevention of dental caries of claim 15 wherein the mammal is a human.

20 18. The method for treatment and prevention of dental caries of claim 17 wherein the purified antibody is produced through the steps of:

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- a) immunizing mice which have been genetically altered to produce human antibodies with at least one cariogenic organism;
 - b) generating hybridomas which secrete antibodies specific to at least one cariogenic organism; and
 - c) isolating the antibodies of step b).

19. The method for treatment and prevention of dental caries of claim 17 wherein the purified antibody is produced through the steps of:

- a) immunizing isolated human B lymphocytes in vitro with at least one cariogenic organism;
- b) generating hybridomas which secrete antibodies specific to at least one cariogenic organism;
- c) isolating the antibodies of step b).

20. The method for treatment and prevention of dental caries of claim 17 wherein the purified antibody is produced through the steps of:

- a) isolating B lymphocytes from humans with an acute infection of at least one cariogenic organism;
- b) generating hybridomas which secrete antibodies specific to at least one cariogenic organism; and
- c) isolating the antibodies of step b).

21. The method for treatment and prevention of dental caries of claim 17 wherein the purified antibody is produced through the steps of:

- a) isolating the genetic sequence that codes for the expression of said variable region;
- b) cloning the genetic sequence that codes for the expression of said variable region;
- c) linking the genetic sequence that codes for the expression of said variable region to the genetic sequence that codes for the expression of said constant region;
- d) expressing said linked sequence; and
- e) isolating the expressed antibodies of step d).

22. The method for treatment and prevention of dental caries of claim 21 wherein step a) is accomplished by screening a phage display random library.

23. The method for treatment and prevention of dental caries of claim 21 wherein the genetic sequence that codes for the expression of said constant region in step c) is derived from IgG or IgM antibodies.

24. The method for treatment and prevention of dental caries of claim 21 wherein the expression of said linked sequence in step d) is conducted in an expression system selected from a group comprising animal, human, chicken egg, or plant.

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